SEMESTER EXAMINATION, DECEMBER -2023

Course Name: -B. Tech.(E.C.E.) **Semester: -1st**

Paper Name: -Fundamental of Electronics Engineering Paper Code: -TES-105

Time - 3 Hrs + 20 minutes per hour extra time for V.I. & examinees with writer. Max Marks-70

Instructions:

- The question paper consists of three sections namely A, B, C. All sections are compulsory.
- Section A- Each question carries 03 marks. All questions are compulsory.
- Section B- Answer any **5 out of 7** given questions in maximum hundred **(150) words**. Each question carries **7 marks**.
- Section C- Answer any **2 out of 3** given questions in maximum five hundred **(300) words**. Each question carries **10 marks**.

Section – A

Objective Questions

3×5=15

1. Answer all the following questions.

1. Which electronic component store electric charge?
   a) Resistor b) Diode
   c) Inductor d) Capacitor
2. What is the fundamental unit of charge?
   a) Coulomb b) Ampere
   c) Volt d) Farad
3. Which component allows current to flow in one direction only?
   a) Resistor b) Capacitor
   c) Diode d) Transistor
4. What is the purpose of a transistor in an electronic circuit?
   a) To amplify or switch electronic signals b) To store electric charge
   c) To control resistance d) To regulate voltage
5. What are the three terminals of a bipolar junction transistor?
   a) Gate, Drain, Source b) Base, Collector, Emitter
   c) Drain, Gate, Source d) Gate, Emitter, Collector

Section – B

Short Answer Questions

2. Answer any five of the following questions in maximum 150 words. **5×7=35**

1. Define electronics, list applications and advantages. Categorize its components and differentiate the analog and digital electronics?
2. Define gate and its construction. Highlight advantages of digital electronics. Discuss basic, universal, and special gates with truth table with its representation.
3. Explain semiconductor and its advantages. Categorize semiconductors by conductivity and energy band gap? Write 2-suitable semiconductor device name based on direct band gap semiconductor.
4. Convert the following decimal number to binary, octal and hexadecimal.
   (a) 10 (b) 100 (c) 1000
5. What is radix or base? Calculate the 1's and 2's complement of the following
   (a) 010 (b) 00100 (c) 111001 (d) 10010
6. Perform step by step multiplication of
   (a) $(1001)_2$ by $(1000)_2$
   (b) $(10001)_2$ by $(100)_2$

C- Answ
n carries 10 marks.

सभी प्रश्न अनिवार्य हैं।

Perform step by step division of

(a) $(10001)_2$ by $(100)_2$

(b) $11111)_2$ by $(100)_2$

7. Write down mechanism of LED, photo diode with VI-Characteristics and also draw its symbolic representation? And explain which type of semiconductor use to design a LED and photo diode.

Section – C
Descriptive Questions

2×10=20

3. Answer any two of the following question in maximum 300 words.

1. Describe the pn junction mechanism, illustrate and elucidate its Voltage-current characteristics, applications, and diode equations.

2. Elaborate on the basic gate utilizing symbol representation, truth table and its representation using with diode or transistor.

3. Describe the BJT mechanism, applications, and explain its different biasing configurations.

Back paper.

BACK PAPER EXAMINATION JUNE, 2024 HELD IN SEPTEMBER-2024

Course Name: - B.Tech
Semester: - I
Paper Name: - Basic Electrical Engineering
Paper Code: - TES 102
Time - 3 Hrs + 20 minutes per hour extra time for V.I. & examinees with writer.
Max Marks-70
समय– 3 घण्टे + 20 मिनट प्रति घंटे अतिरिक्त–दृष्टिबाधित एवं राह लेखक परीक्षार्थियों के लिए।
अधिकतम अंक–70

Instructions:
- The question paper consists of three sections namely A, B, C. All sections are compulsory.
- Section A- Each question carries **3 mark. All questions are compulsory.**
- Section B- Answer any **5 out of 7** given questions in maximum one hundred fifty (150) words. Each question carries **7 marks.**
- Section C- Answer any **2 out of 3** given questions in maximum three hundred (300) words. Each question carries **10 marks.**

निर्देश:
- प्रश्न पत्र में तीन खण्ड अ, ब, व स हैं। सभी खण्ड अनिवार्य हैं।
- खण्ड–अ में प्रत्येक प्रश्न तीन अंक का है। सभी प्रश्न अनिवार्य हैं।
- खण्ड–ब में सात प्रश्नों में से किन्हीं पाँच प्रश्नों के उत्तर अधिकतम 150 शब्दों में दें। प्रत्येक प्रश्न सात अंक का है।
- खण्ड–स में तीन प्रश्नों में से किन्हीं दो प्रश्नों के उत्तर अधिकतम (250-300) शब्दों में दें। प्रत्येक प्रश्न **10** अंक का है।

Section – A (खण्ड–अ)
Objective Questions (वस्तुनिष्ठ प्रश्न)

1. Answer all the following questions. 5x3 =15
निम्नलिखित सभी प्रश्न अनिवार्य हैं।

i) All Meshes are loops but loop are not meshes
   a. Loops, Meshes
   b. Branches, loops
   c. Meshes, loops
   d. Nodes, Branches

C

ii) Materials in which magnetization persists even after the field has been removed are called _____
   a. Diamagnetic
   b. Paramagnetic
   c. Soft Ferro magnets
   d. Hard Ferro magnets

d a c a

iii) Magnitude of current at resonance in R-L-C circuit
   a. Depends upon the magnitude of R
   b. Depends upon the magnitude of L
   c. Depends upon the magnitude of C
   d. Depends upon the magnitude of R, L and C

iv) Form Factor is the ratio of
   a. Average value/ r.m.s. value
   b. Average value/ peak value
   c. r.m.s. value/ average value
   d. r.m.s. value/ peak value

.....

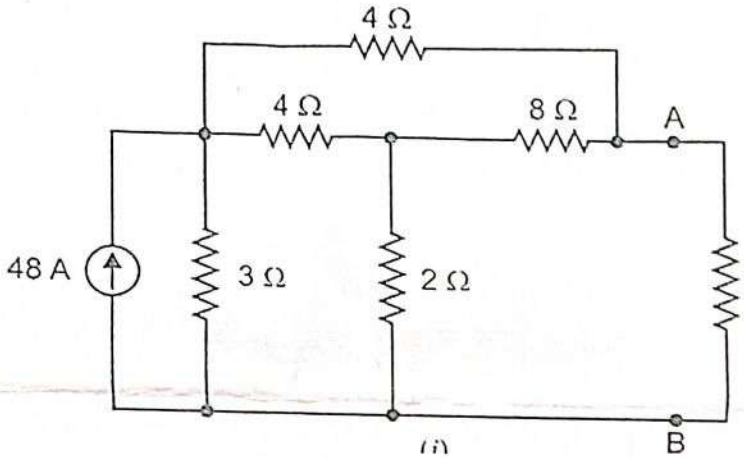
v) If the torque induced is zero in the dc machine, it can be said that _____

a. current is zero
b. flux can be zero
c. current or flux=0
d. None of above

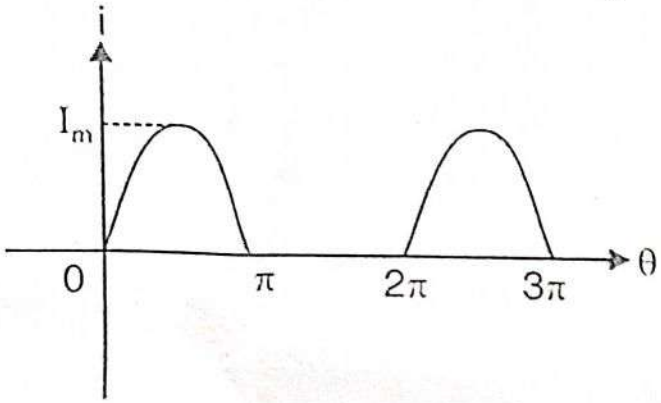
Section – B (खण्ड–ब)
Short Answer Questions (लघुउत्तरीय प्रश्न)

2. Answer any five of the following questions in maximum 150 words. **5x7=35**
निम्नलिखित में से किन्हीं पाँच प्रश्नों के उत्तर अधिकतम 150 शब्दों में दें।

i. In the network shown in below figure, find the Norton equivalent circuit at terminals AB .



ii. In below figure, find the average value, r.m.s. value, form factor and peak factor for (i) half-wave rectified alternating current and (ii) full-wave rectified alternating current.



A coil having a resistance of 7 W and an inductance of 31·8 mH is connected to 230 V, 50 Hz
Calculate (i) the circuit current (ii) phase angle (iii) power factor (iv) power consumed
tage drop across resistor and inductor.

iv. Determine the parameters of a R-L-C series circuit that will resonate at 10 kHz, has a bandwidth of 1 kHz and draws 15.3 W from a 200 V generator operating at the resonant frequency of the circuit.

v. Explain the B-H hysteresis curve point by point with proper figure. Write the difference between soft and hard magnetic materials.

vi. Explain the equivalent circuit of transformer in both conditions (i) when primary circuit referred to secondary and (ii) when secondary circuit referred to primary.

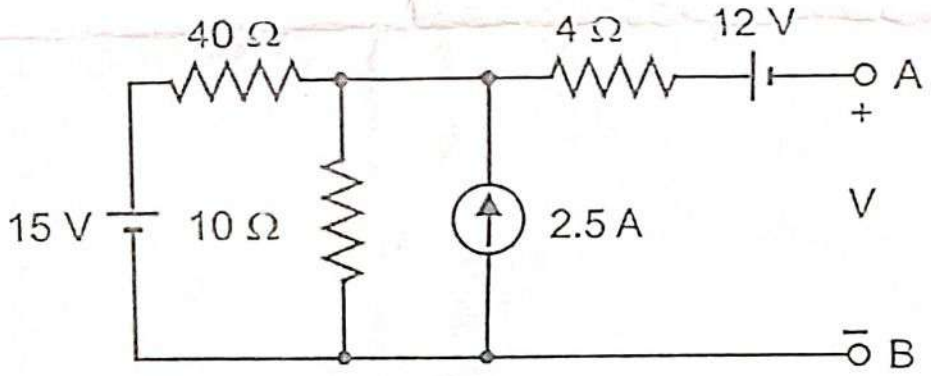
vii. Explain the working principle and operation of Miniature Circuit Breaker (MCB). Also, write advantages of MCB.

Section - C (खण्ड–स)

Descriptive Questions (विवरणात्मक प्रश्न)

3. Answer any two of the following question in maximum 300 words. **2x10=20**
निम्नलिखित में से किन्हीं दो प्रश्नों के उत्तर अधिकतम 300 शब्दों में दें।

i) Use superposition theorem to find the voltage V in Fig.



ii) Three coils, each having a resistance of 20 W and an inductive reactance of 15 W, are connected in star to a 400 V, 3-phase, 50 Hz supply. Calculate (i) the line current (ii) power factor and (iii) power supplied. Also, draw phasor diagram.

iii) Explain the Single Loop DC Generator along with all proper diagrams. Also, write down the EMF Equation of a DC Generator.

.....